STATE OF NEVADA DEPARTMENT OF EDUCATION



2010 - 2011 OUT-OF-SERVICE MANUAL

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INTRODUCTION

The purpose of the Nevada Out-of Service Manual is to identify items on a school bus that would require the bus be placed out-of-service.

The Nevada School Bus Out-of-Service Inspection Manual has utilized the <u>Commercial Vehicle Safety Alliance's 2010 Out-of-Service Criteria</u> to produce this manual. The department would also like to thank all the Nevada Highway Patrol and statewide school district transportation personnel for their assistance in developing and updating this manual. This document was approved by the Nevada State Board of Education during the June 17th and 18th, 2010 State Board of Education meeting and is effective as of that date.

NRS 392.400, gives authority to the Nevada Highway Patrol to inspect school buses in Nevada semiannually. The Nevada Highway Patrol has the authority to place any bus out-of-service for any violation listed in this manual. If the specific item is not listed in this manual, the violation is noted as a deficiency on the School Bus Inspection Form. School buses are inspected according to the Nevada State School Bus Standards, approved by the State Board of Education.

School buses that have an Out-of-Service condition while transporting students are allowed to return to the safest spot or destination, whichever comes first as long as the violation is not a serious mechanical failure and does not immediately impact the safe transportation of the students.

If you have questions regarding this document, please contact Diana Hollander, Program Officer, Pupil Transportation Department, Nevada Department of Education at 9890 S. Maryland Pkwy, Suite 221, Las Vegas, Nevada 89183. Phone number is 702-486-6626 and email address at dhollander@doe.nv.gov.

TABLE OF CONTENTS

I. DRI	VER OUT-OF-SERVICE CRITERIA	6
1	• Drive's Age	6
2		
3.	Driver medical/Physical Requirements	6
4	. Sickness	6
5	• Fatigue	7
6		
7.	\mathcal{E}	
8	\mathcal{C}	
9	Driver's Record of Duty Status	7
II. VE F	HICLE OUT-OF-SERVICE CRITERIA	
1	. BRAKE SYSTEMS	
	a. Defective Bakes	9
	b. Brake Adjustment Limit Reference Charts	11
	c. Front Steering Axle(s) Brakes	
	d. Spring Brake Chamber	16
	e. Parking Brake	16
	f. Brake Smoke/Fire	
	g. Brake Drums or Rotors (discs)	16
	h. Brake Hose and Tubing	
	i. Low Pressure Warning Device	17
	j. Air Loss Rate	17
	k. Air Reservoir	17
	1. Air compressor	
	m. Hydraulic Brakes	
	n. Vaccum System	18
2	. ELECTRICAL CABLES AND SYSTEMS IN ENGINE AS COMPARTMENTS	ND BATTE
	Electrical Cables and Systems in Engine and Battery Compartment	18
3	. EMERGENCY EQUIPMENT	
	a. Fire Extinguisher	19
	b. First Aid and Body Fluid Kit	19
	c. Emergency Warning Devices	19
4	. EMERGENCY EXITS	19
5.	. EXHAUST SYSTEM	20

6. FRAMES & BODY a. Frame Members 20 b. Tire and Wheel Clearance 21 7. FUEL SYSTEM a. Liquid Fuels......21 8. LIGHTING DEVICES (HEADLAMPS, TAIL LAMPS, STOP LAMPS, TURN SIGNALS, LAMPS AND BACK-UP WARNING DEVICE) a. Headlamps23 Four-Way Hazard Lights 23 Overhead Amber Flashing Lights......23 Overhead Red Flashing Lights24 h. Back-Up Warning Alarm......24 9. MISCELLANEOUS Aisle 24 Defrosters......24 Handicap Wheelchair Lift24 10. STEERING MECHANISM Steering Wheel Lash (Free Play)......25 Front Axle Beam and all Steering Components Other than the Steering Column 26

1	١.	Nuts	27
j	į.	Steering System	
11. \$	SU	USPENSION	
8	a.	Axle Parts/Members	28
ł	э.	Spring Assembly	
(Э.	Composite Springs	29
(d.	Torque, Radius, or Tracking Components	29
12.	П	IRES	
8	a.	Any Tire on any Front Steering Axle	32
ł	o.	All Tires other than those found on the Front Steering Axle	32
		HEELS, RIMS and HUBS	2.4
		Lock or Side Ring	
		Rim Cracks	
	3. d.	Bolt/Stud Holes (Disc Wheels)	
	ս. ∋.	Spoke Wheel Cracks	
	f.	Tubeless Demountable Adapter Cracks	
_		Wheel Fasteners.	
-	_	Welds	
i	i.	Hubs	
14 1	. x 7		25
14.	٧V	INDSHIELD WIPERS	35

PART I DRIVER OUT-OF-SERVICE CRITERIA

1. **DRIVER'S AGE:** Driver not at least 21 years of age. (391.11(b)(1)).

2. **CDL**

a. License

Does not possess a valid CDL issued by his/her state or jurisdiction of domicile.

NOTE: "Does not possess a valid CDL" includes, but is not limited to: improper class, expired, cancelled, revoked, disqualified, suspended, or withdrawn.

- b. Learner's Permit
 - (1) Is not accompanied by the holder of a valid CDL.
- c. Endorsements and Restrictions

Operating a commercial vehicle without the proper endorsements or in violation of restrictions. (383.23(a)(2), 391.11(b)(5))

d. Classification

Does not possess the proper class of license for vehicle being operated. (383.91(a))

3. DRIVER MEDICAL/PHYSICAL REQUIREMENTS:

- a. Medical Certificate
 - (1) Operating a commercial vehicle without corrective lenses or hearing aid as indicated on the driver's medical certificate. (391.11(b)(4))
 - (2) When an inspector has knowledge and/or evidence that a driver is/is not in possession of a valid medical certificate, and is not in possession of any and all required exemptions for the following conditions: vision, hearing, insulin-using diabetes, epilepsy or any other conditions which is likely to cause loss of consciousness or any loss of ability to control a commercial motor vehicle. (391.11(b)(4))
 - (3) Operating a passenger-carrying vehicle without possessing a valid medical certificate. (391.41(a))

4. SICKNESS

When so impaired that the driver should not continue on the trip. (392.3)

5. **FATIGUE**

a. When so fatigued that the driver of a passenger-carrying vehicle should not continue the trip. (392.3)

6. **COMMUNICATION**

Driver is unable to communicate sufficiently to understand and respond to official inquiries and directions. (391.11(b)(2)).

7. DRUGS AND OTHER SUBSTANCES

a. Shall not be in possession

Driver shall not be in possession or under the influence of drugs or other substances as identified under section (391.4(a))

8. INTOXICATING BEVERAGES

Any driver who is under the influence of intoxicating beverage, consumes an intoxicating beverage regardless of its alcohol content, or have any measured alcohol concentration or any detected presence of alcohol while on duty, or operating or in physical control of a motor vehicle. (293.5(a))

Be on duty or operate a motor vehicle while the driver possesses an intoxicating beverage, regardless of its alcohol content.

Driver violating any roadside out-of-service order regarding intoxicating beverages.

9. DRIVER'S RECORD OF DUTY STATUS

- a. Passenger Carrying vehicles
 - (1) 10 Hour Rule

Driving more than ten (10) hours following ten (10) consecutive hours off duty.

(2) 15 Hour Rule

Driving for any period after having been on duty fifteen (15) hours following ten (10) consecutive hours off duty. (395.3(1) (2)

(3) 60/70 Rule

Driving after being on duty for more than 60 hours in seven (7) consecutive days or 70 hours in eight (8) consecutive days. (302.3(b) (1))

(4) No Record of Duty Status (Log Book)

No record of duty status in possession when one is required. (395.8(k)(2))

(5) No Previous 7 Days

Failing to have in possession a record of duty status for the previous (7) consecutive days.

(6) False Record of Duty Status (log Book)

A required record of duty status that does not accurately reflect the driver's actual activities and duty status (including time and location of each duty status change and the time spent in each duty status) in an apparent attempt to conceal a violation of an hours of service limitation.

PART II VEHICLE OUT-OF-SERVICE CRITERIA

1. BRAKE SYSTEMS

a. Defective Brakes

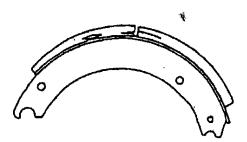
The number of defective brakes is equal to or greater than 20 percent of the service brakes on the vehicle. A defective brake includes any brake that meets one of the following criteria.

NOTE: Steering axle brakes under "Front Steering Axle(s) Brakes", are to be included in the 20 percent criterion.

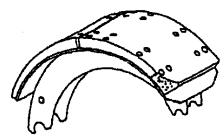
- (1) Absence of effective braking action upon application of the service brakes (such as brake linings failing to move or contact braking surface upon application.) (393.48(a))
- (2) Drum (Cam-Type and Wedge) Air brakes
 - (a) Missing or broken brake shoe, lining, return spring (shoe or chamber), anchor pin, spider, cam roller, camshaft, pushrod, yoke, clevis pin, brake adjustment, parking brake power spring, or air chamber mounting bolt. (393.48(a))
 - (b) Loose air chambers, spiders, or camshaft support brackets. (393.48(a))
 - (c) Defective lining conditions. (393.47)
 - i. Lining cracks or voids that exceed 1/16 inch (1.6 mm) in width observable on the edge of the lining. (393.47(a))
 - ii. Portion of a lining segment missing such that a fastening device (rivet or bolt) is exposed when viewing the lining from the edge. (393.47(a))
 - iii. Crack exceeds 1-1/2 inch (38.1mm) in length. (393.47(a))
 - iv. Loose lining segment. (Approximately 1/16 inch (1.6 mm) or more movement.) (393.47(a))
 - v. Complete lining segment missing. (393.47(a))
 - vi. The friction surface of the brake drum and the brake friction material are contaminated by oil, grease, or brake fluid. (393.47(a))

NOTE: Also refer to "Wheels, Rims and Hubs" if wheel seal is actively leaking.

vii. Lining thickness less than ¼ inch (6.5 mm) or to wear indicator if lining is so marked, measured at the shoe center. (393.47(d)(2))



Out-of-Service
Cracks or voids that exceed 1/16" in width
Cracks that exceed 1 1/2 " in length



Out-of-ServicePortion of lining missing that exposes a fastening device.

- (3) Air Disc Brakes (Exposed Pushrods and Direct Coupled air Chamber to Caliper)
 - (a) Missing or broken caliper, brake pad, pad retaining component, pushrod, yoke, clevis pin, brake adjuster, parking brake power spring, chamber return spring, or air chamber mounting bolt. (393.48(a))
 - (b) Loose or missing brake chamber or caliper mounting bolt. (393.48(a))
 - (c) Rotor has evidence of metal to metal contact over the rotor friction surface on either side. (393.48(a))
 - (d) Rotor has severe rusting on the rotor friction surface on either side (light rusting on the friction surface is normal). (393.49(a))
 - (e) The friction surface of the brake rotor and the brake friction material are contaminated by oil or grease. (393.47(a))
 - NOTE: Also refer to "Wheels, Rims and Hubs" if wheel seal is actively leaking.
 - (f) Brake pad thickness less than 1/16 inch (1.6mm) or to wear indicator if pad is so marked. (393.47(d)(2))

(4) Audible Air Leak at air Chamber. (Example: ruptured diaphragm, loose chamber clamp, etc.) (396.3(a)(1))

Note: Refer to "Air Loss Rate".

- (5) Brake Adjustment Limits. Bring reservoir pressure between 90 100 psi (620 690 kPa), turn engine off and then fully apply the brakes. All brake measurement shall be made in 1/8 inch (3.2 mm) increments.
 - (a) One brake at ¼ inch (6.5mm) or more beyond the adjustment limit. (Example: Type 30 clamp type air chamber pushrod measured at 2-1/4 inches (57.15mm) would be one defective brake.) (393.47(e))

b. Brake Adjustment Limit Reference Charts

CLAMP TYPE BRAKE CHAMBER DATA			
TYPE	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT	
6	4-1/2 (114mm)	1-1/4 (31.75mm)	
9	5-1/4 (133mm)	1-3/8 (34.93mm)	
12	5-11/16 (145mm)	1-3/8 (34.93mm)	
16	6-3/8 (162mm)	1-3/4 (44.45mm)	
20	6-25/32 (172mm)	1-3/4 (44.45mm)	
24	7-7/32 (184mm)	1-3/4 (44.45mm)	
30	8-3/32 (206mm)	2 (50.80mm)	
36	9 (229mm)	2-1/4 (57.15mm)	

NOTE: Service chambers with housings that are permanently crimped and sealed together are considered clamp type chambers even though they do not have a separate clamp band.

NOTE: A brake found at the adjustment limit is not a defect for the purposes of the 20% rule.

'LONG STROKE' CLAMP TYPE BRAKE CHAMBER DATA			
ТҮРЕ	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT	
12	5-11/16 (145mm)	1-3/4 (44.45mm)	
16	6-3/8 (162mm)	2 (50.80mm)	

20 (2-1/2" rated stroke)	6-25/32 (172mm)	2 (50.80mm)
20 (3" rated stroke)	6-25/32 (172mm)	2-1/2 (63.50mm)
24 (2-1/2" rated stroke)	7-7/32 (184mm)	2 (50.80mm)
24 (3"rated stroke)	7-7/32 (184mm)	2 -1/2 (63.50mm)
30	8-3/32 (206mm)	2 -1/2(63.50mm)

NOTE: Rated stroke is indicated on a tag and is only used to identify chamber size.

NOTE: Service chambers with housings that are permanently crimped and sealed together are considered clamp type chambers even though they do not have a separate clamp band.

NOTE: A brake found at the adjustment limit is not a defect for the purposes of the 20% rule.

BOLT TYPE BRAKE CHAMBER DATA			
ТҮРЕ	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT	
A	6-15/16 (176mm)	1-3/8 (34.93mm)	
В	9-3/16 (234mm)	1-3/4 (44.45mm)	
C	8-1/16 (205mm)	1-3/4 (44.45mm)	
D	5-1/4 (133mm)	1-1/4 (31.75mm)	
Е	6-3/16 (157mm)	1-3/8 (34.93mm)	
F	11 (279mm)	2-1/4 (57.15mm)	
G	9-7/8 (251mm)	2 (50.80mm)	

NOTE: A brake found at the adjustment limit is not a defect for the purposes of the 20% rule.

ROTOCHAMBER DATA			
ТҮРЕ	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT	
9	4-9/32 (109mm)	1-1/2 (38.10mm)	
12	4-13/16 (122mm)	1-1/2 (38.10mm)	

16	5-13/32 (138mm)	2 (50.80mm)
20	5-15/16 (151mm)	2 (50.80mm)
24	6-13/32 (163mm)	2 (50.80mm)
30	7-1/16 (180mm)	2-1/4 (57.15mm)
36	7-5/8 (194mm)	2-3/4 (69.85mm)
50	8-7/8 (226mm)	3 (76.20mm)

NOTE: A brake found at the adjustment limit is not a defect for the purposes of the 20% rule.

DD-3 BRAKE CHAMBER DATA			
ТҮРЕ	OUTSIDE DIAMETER		BRAKE ADJUSTMENT LIMIT
30	8-1/8 (206mm)		2-1/4 (57.15mm)

NOTE: This chamber has three air lines and is found on motor coaches.

NOTE: A brake found at the adjustment limit is not a defect for the purposes of the 20% rule.

(1) Wedge Brake Data

The combined movement of both brake shoe lining scribe marks shall not exceed 1/8 inch (3.20mm).

(a) A brake found at 1/8 inch (2.3mm) beyond the brake adjustment limit shall be considered .5 (1/2) a defective brake for determining the number of defective brakes per the 20 percent defective brake criterion. (Example: Type 30 clamp type brake chamber pushrods measure – Two (2) at 2 -1/8 inches (54 mm) equal 1 defective brake). (393.47(e))

NOTE: When the vehicle, or combination of vehicles, is out-ofservice for 20 percent brake violations, all brakes found beyond the brake adjustment limit must be repaired.

NOTE: When calculating/determining the number of defective brakes, round all fractions down to the next whole number (e.g. 4.5 brake violations = 4 defective brakes).

(b) Any wedge brake where the combined brake lining movement of both top and bottom shoes exceeds 1/8 inch (3.2mm). (393.47(f))

c. Front Steering Axle(s) Brakes

In addition to being included in the 20 percent criterion, the following criteria place a vehicle in an out-of-service condition:

- (1) Any inoperative or missing brake on either wheel of any steering axle of any vehicle equipped or required to be equipped with steering axle brake. (393.42, 393.48(a))
- (2) Drum (Cam-type and Wedge) air brakes
 - (a) Mismatched air chamber sizes. (393.47(b))

NOTE: Mismatched air chamber size excludes long stroke air chamber versus regular stroke air chamber and excludes differences in design type such as type 20 clamp versus type 20 rotochamber. A bolt chamber with any other chamber type is a mismatch.

- (b) Mismatched brake adjustment length. (393.47(c))
- (c) Defective lining conditions
 - i. Lining cracks or voids exceed 1/16 inch (1.6mm) in width observable on the edge of the lining. (393.47(c))
 - ii. Portion of a lining segment missing such that a fastening device (rivet or bolt) is exposed when viewing the lining from the edge. (393.47(a))
 - iii. Crack that exceeds 1-1/2 inch (38.1mm) in length. (393.47(a))
 - iv. Loose lining segment. (Approximately 1/16 inch (1.6mm) or more movement.) 393.47(a))
 - v. Complete lining segment missing. (393.47(a))
 - vi. The friction surface of the brake drum and the brake friction material are contaminated by oil or grease. (393.47))
 - NOTE: Also refer to "Wheels, Rims and Hubs" if wheel is actively leaking.
 - vii. Lining with a thickness less than 3/16 inch (4.8mm) for a shoe with a continuous strip of lining or ¼ inch (6.5mm) for a shoe with two lining blocks for drum brakes or to wear indicator if lining is so marked. (393.47(d)(1))

- (3) Air Disc Brakes (Exposed Pushrods and Direct Coupled Air Chamber to Caliper)
 - (a) Mismatched air chamber sizes. (393.47(b))

NOTE: Mismatched air chamber sizes excludes long stroke air chamber versus regular stroke air chamber. A mismatch on an air disc brake exists only when there is measurable difference in air chamber clamp sizes.

- (b) Mismatched brake adjuster length. (393.47(c))
- (c) Missing brake pad. (393.47)
- (d) Rotor has evidence of metal to metal contact over the rotor friction surface on either side. (393.48(a))
- (e) Rotor has severe rusting on the rotor friction surface on either side (light rusting on the friction surface is normal). (393.48(a))
- (f) The friction surface of the brake rotor and the brake friction material are contaminated by oil or grease. (393.47(a))
 - NOTE: Also refer to "Wheels, Rims and Hubs" if wheel seal is actively leaking.
- (g) Brake pad thickness less than 1/16 inch (1.6mm) or to wear indicator if lining is so marked. (393.47(d)(1))
- (4) Hydraulic Brakes
 - (a) Missing lining or pad. (393.47(a))
 - (b) Movement of the caliper within the anchor plate, in the direction of wheel rotation, exceeds 1/8 inches (3.2mm). (393.48(a))
 - (c) Rotor has evidence of metal to metal contact over the rotor friction surface on either side. (393.48(a))
 - (d) Rotor has severe rusting on the rotor friction surface on either side (light rusting on the friction surface is normal). (393.48(a))
 - (e) The friction surface of the brake drum or rotor and the brake friction material are contaminated by oil, grease, or brake fluid. (393.47(a))
 - NOTE: Also refer to "Wheels, Rims and Hubs" if wheel seal is actively leaking.
 - (f) Lining with a thickness of 1/16 inch (1.6mm) or less at the shoe

d. Spring Brake Chamber

Any non-manufactured holes or cracks in the spring brake chamber housing section of a parking brake. (366.3(a)(1))

e. **Parking Brake**

No brakes on the vehicle are applied upon actuation of the parking brake control, including driveline hand controlled parking brakes. (393.41)

f. Brake Smoke/Fire

Brake malfunction causing smoke or fire to emit from the wheel end. (393.48)(a))

Example: Brake lining continuously in contact with brake drum or rotor.

NOTE: This does not include overheating due to severe brake use.

NOTE: Refer to "Wheels, Rims and Hubs"; as the cause may either be the brakes or a problem in the hub and bearing area.

g. Brake Drums or Rotors (Discs)

- (1) Any portion of the drum has any external crack, or has any crack that opens upon brake application. (393.47(a))
- (2) Any rotor (disc) with a crack in length of more than 75percent of the friction surface and passes completely through the rotor to the center vent from either side or completely through a solid rotor. (393.47(a))
- (3) Any portion of the drum or rotor (discs) missing or in danger of falling away. (393.47(a))

NOTE: Do not confuse short hairline heat check cracks with flexural cracks. (393.47(a))

h. **Brake Hose/Tubing**

(1) Any damage extending through the outer reinforcement ply. (393.45(a))

NOTE: Rubber impregnated fabric cover is not a reinforcement ply.

NOTE: Thermoplastic nylon tube may have braid reinforcement or color difference between cover and inner tube. Exposure of second color is out-of-service condition.

(2) Bulge/swelling when air pressure is applied. (393.45(a))

- (3) Audible leak at other than a proper connection. (393.45(a))
- (4) Improperly joined such as a splice made by sliding the hose ends over a piece of tubing and clamping the hose to the tube. (393.45(a))
- (5) Damaged by heat, broken, or crimped in such a manner as to restrict air flow. (393.45(a))

i. Low pressure warning device

Low pressure warning device missing, inoperative, or does not operate if either the primary or secondary reservoir is at 55 psi (379kPa) and below, or 1/2 of the governor cut-out pressure, whichever is less. (393.51(c))

NOTE: If either an audible or visual warning device is working as required, vehicle should not be placed out-of-service.

j. Air Loss Rate

If an air leak is discovered and either the primary or secondary reservoir pressure is not maintained when: (396.3(a)(1))

- (1) Governor is cut-in;
- (2) Reservoir pressure is between 80 90 psi (551-620 KPA);
- (3) Engine is at idle; and
- (4) Service brakes are fully applied.

k. Air reservoir

Air Reservoir security; separated from its original attachment points. (396.3(a)(1))

- l. **Air Compressor** (Normally to be inspected when readily visible or when conditions indicate compressor problems.)
 - (1) Loose compressor mounting bolts. (396.3(a)(1))
 - (2) Cracked, broken, or loose pulley. (396.3(a)(1))
 - (3) Cracked or broken mounting brackets, braces, or adapters. (396.3(a)(1))
- m. **Hydraulic Brakes** (Including: Power Assist over Hydraulic and Engine Driven Hydraulic Booster.)
 - (1) No pedal reserve with engine running. (393.40(b))

- (2) Master cylinder less than 1/4 full. (396.3(a)(1))
 - NOTE: Normally to be inspected when readily visible or problems are apparent.
- (3) Power assist unit fails to operate. (396.3(a)(1))
- (4) Seeping or swelling brake hose(s) under application of pressure. (393.45(a))
- (5) Hydraulic hose(s) abraded (chafed) through outer cover-to-fabric layer. (393.45)(393.45(b)(2))
- (6) Fluid lines or connections restricted, crimped, cracked, or broken. (393.45(a))
- (7) Any visually observed leaking hydraulic fluid in the brake system upon full application. (393.45(a))
- (8) Brake failure light/low fluid warning light on and/or inoperative. (393.51(b))

n. Vacuum System

- (1) Insufficient vacuum reserve to permit one full brake application after engine is shut off. (393.50(b))
- (2) Vacuum hose(s) or line(s) restricted, abraded (chafed) through outer coverto-cord ply, crimped, cracked, broken, or has collapse of vacuum hose(s) when vacuum is applied. (393.45(a)(b)(2))

2. ELECTRICAL CABLES AND SYSTEMS IN ENGINE AND BATTERY COMPARTMENTS

- a. Electrical cable insulation chafed, frayed, damaged, burnt, causing bare cable to be exposed. (393.28)
- b. Loose or corroded connections at battery posts or unsuitable insulated protection to electronic components. (393.28)
- c. Missing or damaged protective grommets insulating electrical cables through metal compartments panels. (393.28)
- d. Broken or unsecured mounting of electrical components. (396.3(a)(1))
- e. Electrical cables unsupported, hanging or missing clamps that may cause a chafing or frayed condition. (393.28)

f. Any visible leaking of lubricant (i.e., engine supplied oil pressure) from electrical component such as alternator, auxiliary heater, etc. (396.5(b))

Note: A cable is the power-conveying part of a high wattage/voltage electrical system. It usually has no circuit overload protection included in the system (i.e. battery to electrical starter or alternator to battery).

3. EMERGENCY EQUIPMENT - (All emergency equipment must be readily accessible to the driver.)

a. Fire Extinguisher

Any vehicle not equipped with at least one type 2A10BC, 5 pound pressurized, dry chemical fire extinguisher with current certification tag.

b. First Aid and Body Fluid Kit

Any vehicle that does not have a first aid kit and body fluid kit that is readily accessible and labeled.

c. Emergency Warning Devices

Any vehicle not equipped with at least three reflectorized triangle road warning devices.

4. EMERGENCY EXITS

- a. Emergency exits that are missing, inoperable, or obstructed. (392.62, 393.203)
- b. All emergency doors shall be accessible by a 12 inch minimum aisle. Aisle shall be unobstructed at all times by any type of barrier, seat, wheelchair or tie down, unless a flip seat is installed and occupied. A flip seat in the unoccupied (up) position shall not obstruct the 12 inch minimum aisle to any side emergency door and must be fully operational and flip up with slight hand pressure.
- c. The seat backs shall be slanted sufficiently to give aisle clearance of 15 inches at top of seat backs at center line.
- d. Any vehicle equipped with a buzzer or bell which does not operate when raised to an open position.
- e. Any emergency exit equipped with a starter interlock that is non-operational.
- f. Any vehicle whose emergency doors and windows are not marked according to the standards that were in effect at the time the bus was ordered.

NOTE: Exterior emergency window markings were required after 11-02-92.

NOTE: Does not include operating instructions.

5. EXHAUST SYSTEM

a. Any bus exhaust system or discharging under the chassis more than 6 inches (15.24cm) forward of the rear most part of the bus when powered by a gasoline engine, or more than 15 inches (38.1cm) forward of the rear most part of the bus when powered by other than a gasoline or diesel engine. (393.83)(d))

NOTE: Engine must be running to verify exhaust leaks.

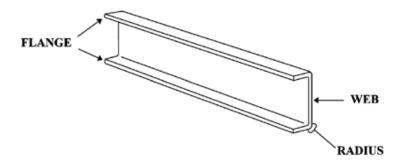
b. No part of the exhaust system of any motor vehicle shall be so located as to be likely to result in burning, charring, or damaging the electrical wiring, the fuel supply, or any combustible part of the motor vehicle. (393.83(a))

6. FRAMES & BODY

a. Frame members

- (1) Any cracked, loose, sagging, or broken frame siderail permitting shifting of the body onto moving parts or other condition indicating an imminent collapse of the frame. (393.201(a))
- (2) Any cracked, loose, or broken frame member adversely affecting support of functional components such as steering gear, engine, transmission, body parts and suspension. (393.201(a))
- (3) One and one-half inches (38'mm) or longer crack in frame siderail web which is directed toward bottom flange. (393.201(a))
- (4) Any crack extending from the frame siderail web around the radius and into the bottom flange. (393.201(a))
- (5) One inch (25mm) or longer crack in siderail bottom flange. (393.201(a))

NOTE: Items (1) and (2) above apply to all buses, including those having unitized (monocoque) construction. Items (3) and (4) apply only to buses having a body-on-chassis design, such as most school buses.



b. Tire and Wheel Clearance

Any condition, including loading, that causes the body or frame to contact with a tire or any part of the wheel assemblies, at the time of inspection (396.3(a)(1))

c. Roof/Body Structure (Applicable only to Carpenter School Buses).

- (1) Any body structure area (roof bow/Carlin rail/window post) that is cracked.
- (2) Any body structure area (roof bow/Carlin rail/window post) that has been welded and has cracked again, or additional cracks appear in the structural area after initial welding has occurred, is permanently scrapped.
- (3) Any body structure area (roof bow/Carlin rail/window post) where 20% or more of the structural area is cracked, will be scrapped.
- (4) Any lower Carlin rail that is cracked all the way through will be scrapped.

NOTE: Carpenter buses roof/body structure will be required to be inspected yearly.

7. FUEL SYSTEM

a. Liquid Fuels

- (1) A fuel system with a dripping leak at any point (including refrigerator or heater fuel systems). (396.3(a)(1))
- (2) A fuel tank not securely attached to the vehicle. (393.65(c))
 - NOTE: Some fuel tanks use spring or rubber bushings to permit movement.
- (3) Vehicle missing fuel cap. (393.67(c)(7)(v))

b. Gaseous Fuels

Compressed Natural Gas (CNG), liquefied Petroleum Gas (LPG) and Liquefied Natural Gas (LNG)

OCCUPATIONAL SAFETY NOTE: Personnel must exercise extreme caution whenever checking a gaseous fuel system for leaks. Any possibility of creating sparks, static electricity, friction, etc., must be avoided as they could cause a fire or explosion.

OCCUPATIONAL SAFETY NOTE: Vehicles with leaking gaseous fuel systems must be parked carefully. Gases escaping from CNG and LNG systems will rise. If

the vehicle is parked inside a building or under a canopy, roof or similar cover, combustible gasses can collect beneath the ceiling. Escaping LPG falls and can form a "pool" of combustible gas near the ground and displaces air including oxygen. LPG and liquid LNG will flow into open drains. Combustible gases can explode when ignited by an open flame or spark.

(1) CNG or LPG

- (a) Any fuel leakage from the CNG or LPG system detected by smell and verified by either a bubble test using non-ammonia, non-corrosive soap solution or a flammable gas detection meter. (396.3(a)(1))
- (b) Any fuel leakage from the CNG or LPG system detected audibly and verified by either a bubble test using non-ammonia, non-corrosive soap solution or flammable gas detection meter. (396.3(a)(1))

NOTE: Verification is needed to ensure that the sound is not either internal to the fuel system (such as gas flowing in a pressure regulator, or pressure equalizing between manifold tanks) or a leak in the air brake system.

(c) Any fuel leakage from the CNG or LPG system detected visibly (evidence such as ice buildup or fuel system connections and fittings) and verified by either a bubble test using non-ammonia, non-corrosive soap solution or a flammable gas detection meter. (396.(a)(1))

NOTE: Some brief fuel leakage or decompression may occur during refueling, causing temporary frosting of CNG or LPG fuel system parts. If the vehicle has been refueled shortly before inspection, care must be taken to distinguish these temporary frosting occurrences from actual leaks.

(2) LNG

OCCUAPTIONAL SAFETY NOTE: LNG is a cryogenic material and presents a potential safety hazard due both to the extremely cold temperature of its liquid and the flammability of its vapor. Personnel inspecting such systems should exercise utmost caution including the wearing of proper eye protection, gloves and clothing.

NOTE: LNG liquid and vaporized gas is odorless and undetectable by the human sense of smell. Frost buildup is not necessarily evidence of leakage. Many components of LNG fuel systems are extremely cold and will exhibit an even coat of frost produced by moisture in the surrounding air condensing and freezing on them.

(a) A cloud of water vapor coming from any component of the fuel system. (396.3(a)(1))

NOTE: It is normal, particularly in humid conditions, for water vapor to collect around many portions of a LNG fuel system.

- (b) Any leak detected by a methane detection meter. (396.3(a)(1))
- (c) Dripping liquid that boils or vaporizes in the air. (396.3(a)(1))

8. LIGHTING DEVICES (HEADLAMPS, TAIL LAMPS, STOP LAMPS, TURN SIGNALS, LAMPS AND BACK-UP WARNING ALARM)

a. **Headlamps**

The bus does not have at least one head lamp operating on low beam. (Inoperative -(393.9(a)); Obscured -(393.9(b)); Missing -(393.11(a)(1)); or, Driveaway -(393.17(a)(1))

b. Lamps on Rear

The bus does not have at least one steady burning tail lamp on the rear of the vehicle, visible from 500 feet (152.4m). (Inoperative – (393.9(a)); Obscured – (393.9(b)); Missing – (393.11(a)(1)); or, Driveaway – (393.17(b)(2));

c. Stop Lamp

Does not have at least one operative stop lamp on the rear of a vehicle, visible at 500 feet (152.4m). (Inoperative – (393.9(a)); Obscured – (393.9(b)); Missing – (393.11(a)(1)); or, Driveaway – (393.17(b)(2))

d. Turn Signals

Does not have operative turn signals visible on each side of the rear of the vehicle. (Inoperative – (393.9(a)); Obscured – (393.9(b)); Missing – (393.11(a)(1)); or, Driveaway – (393.17(b)(2))

e. Four-way hazard lights

Four way hazard lights do not fully operate in the front and rear if the vehicle.

f. Overhead Amber Flashing Lights

Overhead amber flashing lights do not fully operate when door is closed.

g. Overhead Red Flashing Lights

Overhead red flashing lights do not fully operate when vehicle is stopped and the loading/unloading door is open.

h. Back-Up Warning Alarm

The back-up warning alarm is not operating.

9. **MISCELLANEOUS**

a. Aisle

Any aisle that is obstructed or has objects blocking the exits.

b. Crossing Control Arm

Any vehicle not equipped with a crossing control arm, or any vehicle whose crossing control arm is non-operational.

NOTE: Crossing control arms are not required for a school bus which is used solely to transport pupils with special needs who are individually loaded and unloaded in a manner which does not require them to walk in front of the bus.

c. **Defrosters**

Any vehicle whose defrosters are not operational in inclement weather.

d. **Handicap Wheelchair Lift**

(1) Wheelchair lift does not function as designed or is inoperable.

NOTE: Only applicable when transporting special needs students who would require the use of a handicapped lift.

- (2) Any hydraulic line leaking during operation.
- (3) Any wheelchair tie down that is missing or improperly installed, loose or damaged.
- (4) Any wheelchair tie down this is not secure.
- (5) Any lift with a platform barrier/roll stop that is non-operational.
- (6) Any wheelchair lift whose brake interlock system, if equipped, is non-operational.

e. **Handrails**

Any vehicle whose handrails have not been modified to ensure that hood cords, back pack straps or belts will not become entangled.

f. Horn

Any vehicle whose horn does not work.

g. Interior and Exterior Mirrors

Any vehicle whose interior and exterior mirrors are cracked, broken or missing.

h. Seats

- (1) Any vehicle with a seat that has been placed in the aisle.
- (2) Any seat/cushion that is not secured properly.
- (3) Any seat/barrier material so defective that it compromises the integrity of occupant protection and compartmentalization.

i. Seat Belts

When required, all seat belts and restraining devices shall be free from defects.

j. Stop Signal Arm(s)

- (1) Any vehicle manufactured after October 13, 1987, whose stop signal arm(s) does not fully extend either automatically or manually when activated, or does not have at least one operable warning lamp.
- (2) Any vehicle manufactured after October 13, 1987 and equipped with a LED light system, where at least 15% of the LED lights are inoperable.

k. Windows

- (1) Any vehicle whose windows are cracked with edges protruding on the inside of the bus.
- (2) Any vehicle whose windshield glass or driver side window has multiple cracks which obscure the driver's view.

10. STEERING MECHANISM

a. Steering Wheel Lash (Free Play)

(See chart below: When any of these values - inch movement or degrees - are met or exceeded, vehicle shall be placed out-of-service.) (393.209(b))

For power steering systems, the engine must be running.

Steering Wheel Diameter	Manual System Movement 30°	Power System Movement 45°
16" (40.6cm)	4 1/2" (11.cm)(or more)	6 3/4" (17.1cm)(or more)
18" (45.7cm)	4 3/4" (12.7cm)(or more)	7 1/8" (18.1cm) (or more)
19" (48.2cm)	5" (12.7cm)(or more)	7 1/2" (19cm)(or more)
20" (50.8cm)	5 1/4" (13.3cm)(or more)	7 7/8" (20cm)(or more)
21" (53.3cm)	5 1/2" (13.9cm)(or more)	8 1/4" (20.9cm) (or more)
22" (55.8cm)	5 3/4" (14.6cm)(or more)	8 5/8" (21.9cm)(or more)

For power systems, if steering wheel movement exceeds 45 degrees before steering axle tires move, proceed as follows: Rock steering wheel left to right between points of power steering valve resistance. If that motion exceeds 30 degrees (or the inch movement values shown for manual steering) vehicle shall be placed out-of-service. This test is to differentiate between excessive lash and power systems designed to avoid providing steering assistance when the steering wheel is turned while the vehicle is motionless (not moving forward or backward).

b. **Steering Column**

- (1) Any absence or looseness of U-bolt(s) or positioning part(s). (393.209(c))
- (2) Obviously repair-welded universal joint(s). (393.209(d))
- (3) Steering wheel not properly secured. (393.209(a))
- (4) Telescopic steering column does not lock into position. (396.3(a)(1))
- (5) Tilt steering column does not lock in at least one position. (396.3(a)(1))

c. Front Axle Beam and all Steering Components other than Steering Column: (Including hub)

- (1) Any crack(s). (396.3(a)(1))
- (2) Any obvious welded repair(s). (396.3(a)(1))

d. Steering Gear Box (Including Rack and Pinion)

(1) Any mounting bolt(s) loose or missing. (393.209(d))

- (2) Any crack(s) in gear box or mounting brackets. (393.209(d))
- (3) Any obvious welded repairs. (396.3(a)(1))
- (4) Any looseness of the yoke-coupling to the steering gear input shaft. (393.209(d))

e. **Pitman Arm**

- (1) Any looseness of the pitman arm on the steering gear output shaft. (393.209(d))
- (2) Any obvious welded repairs(s). (396.3(a)(1))

f. **Power Steering**

- (1) Auxiliary power assist cylinder loose. (393.209(e))
- (2) Evidence of power steering fluid leaking steadily (showing little variation or fluctuation) from any component in the system. This includes any component that shares the reservoir to the power steering system.

g. Ball and Socket Joints

- (1) Any movement under steering load of a stud nut. (393.209(d))
- (2) Any motion, other than rotational, between any linkage member and its attachment point of more than 1/8 inch (3.2mm) measured with hand pressure only. (393.209(d))
- (3) Any obvious welded repair(s). (393.209(d))

h. Tie Rods and Drag Links

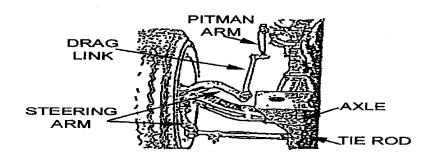
- (1) Loose clamp(s) or clamp bolt(s) on tie rods or drag links. (396.3(a)(1))
- (2) Any looseness in any threaded joint. (396.3(a)(1))

i. Nuts

Loose or missing on tie rods, pitman arm, drag link, steering arm, or tie rod arm. (396.3(a)(1))

j. Steering System:

Any modification or other condition that interferes with the free movement of any steering component. (393.209(d))



11. SUSPENSION

a. Axle Parts/Members

- (1) Any u-bolt(s) or other spring to axle clamp bolt(s) cracked, broken, loose, or missing. (393.207(a))
- (2) Any axle, axle housing, spring hanger(s), or other axle positioning part(s) cracked, broken, loose, or missing resulting in shifting of an axle from its normal position. (393.207(a))

NOTE: After a turn, lateral axle displacement is normal with some suspensions including composite springs mounted on steering axles.

b. Spring Assembly

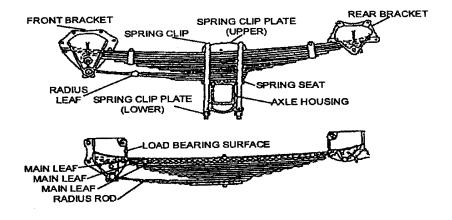
- (1) One-fourth or more of the leaves in any spring assembly broken. (393.207(c))
- (2) Any leaf or portion of any leaf in any spring assembly is missing or separated. (393.207(c))
- (3) Any broken main leaf in a leaf spring. (393.207(c))

NOTES:

- 1. Any leaf of leaf spring assembly is a main leaf if it extends, at both ends, to or beyond:
 - a. The load bearing surface of a spring hanger or equalizer.
 - b. The spring end cap or insulator box mounted on the axle.
 - c. A spring eye, further: Any leaf of a helper spring assembly is a helper main leaf if it extends, at both

ends, to or beyond the load bearing surface of its contact pad, hanger, or equalizer.

2. The radius rod leaf, in springs having such a leaf, has the same function as the torque or radius components referenced in "Suspensions - Torque, Radius, Tracking or Sway Bar Components" and should be treated as such a component for purposes of out-of-service.



- (4) Coil spring broken. (393.207(d))
- (5) Rubber spring missing. (393.207(a))
- (6) One or more leaves displaced in a manner that could result in contact with a tire, rim, brake, drum, or frame. (393.207(c))
- (7) Broken torsion bar spring in torsion bar suspension. (393.207(e))
- (8) Deflated air suspension (one or more deflated air spring/bag). (393.207(f))

c. Composite Springs

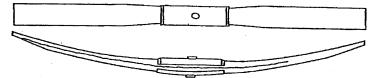
- (1) Intersecting cracks of any length. (393.207(c))
- (2) A crack that extends beyond 3/4 the length of the spring. (393.207(c))

NOTE: A crack is a separation in any axis which passes completely through the spring.

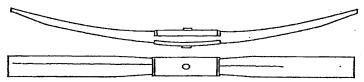
d. Torque, Radius or Tracking Components

Any part of a torque, radius, or tracking component assembly or any part used for attaching same to the vehicle frame or axle that is cracked, loose, broken, or missing (including spring leaves used as a radius or torque rod, missing bushings but not loose bushings in torque or track rods). (393.207(a))

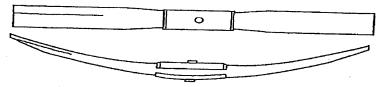
Out-of-Service Conditions



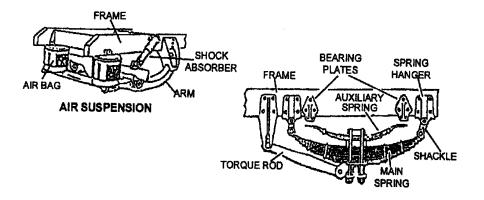
a) Side to side crack extending beyond 3/4 of the length of the spring. (A crack that extends beyond 3/4 the length of the spring.)

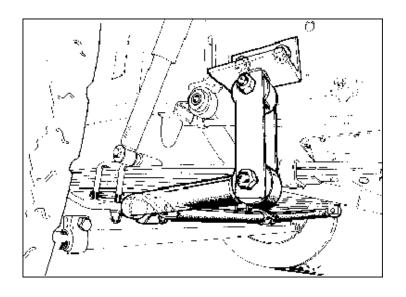


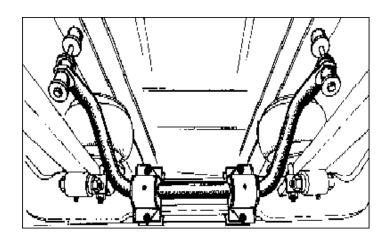
b) Top to bottom crack extending beyond 3/4 of the length of the spring. (A crack that extends beyond 3/4 the length of the spring.)

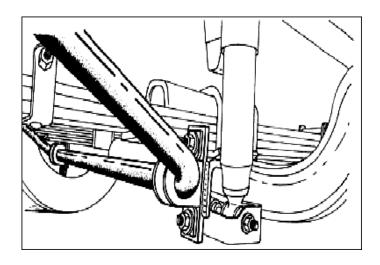


c) Intersecting cracks of any length.









12. TIRES

a. Any Tire on any Front Steering Axle

(1) With less than 4/32 inch tread when measured in any two adjacent major tread grooves (typically any groove containing a tread wear indicator) at any location on the tire. (393.75(b))

NOTE: Measurements should not be made on stone ejectors or tread wear indicators.

- (2) When any part of the belt material, breaker strip or casing ply is showing in the tread. (393.75(a))
- (3) When sidewall is cut, worn, or damaged to the extent that the steel or fabric ply cord is exposed. (393.75(a)(1))
- (4) Labeled "Not For Highway Use" or carrying other markings that indicate excluded use on steering axles. (396.3(a)(1))
- (5) Visually observable bump, bulge, or knot apparently related to tread or sidewall separation. (393.75(a))
 - EXCEPTION: A bulge (due to a repair) of up to 3/8 inch (9.5mm) in height is allowed. This bulge may sometimes be identified by a blue triangular label in the immediate vicinity.
- (6) Tire has noticeable (e.g., can be heard or felt) leak, or has 50 percent or less of the maximum inflation marked on the tire sidewall. (393.75(a)(3))

NOTE: Measure tire air pressure only if there is evidence the tire is under-inflated.

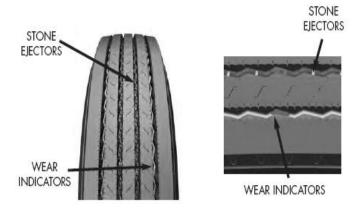
- (7) So mounted or inflated that it comes in contact with any part of the vehicle. (396.3(a)(1))
- (8) Weight carried exceeds tire load limit. This includes overloaded tire resulting from low air pressure. (Load Limit (393.75(f) or Inflation Pressure (393.75(h))
- (9) Any vehicle that bias and radial tires have been combined.
- (10) Any vehicle with regrooved, recapped, or retread tires. (393.75(d))

b. All Tires Other than Those Found on the Front Steering Axle

(1) Tire has noticeable (e.g., can be heard or felt) leak, or has 50 percent or less of the maximum inflation pressure marked on the tire sidewall. (393.75(a)(3))

NOTE: Measure tire air pressure only if there is evidence the tire is under-inflated.

- (2) Any tire with visually observable bump or knot apparently related to tread or sidewall separation. (393.75(a)(2)
 - EXCEPTION: A bulge (due to a repair) of up to 3/8 inch (9.5mm) in height is allowed. The bulge may sometimes be identified by a blue triangular label in the immediate vicinity.
- (3) So mounted or inflated that it comes in contact with any part if the vehicle. (396.3(a)(1))
 - NOTE: This includes any tire contacting its mate in a dual set.
- (4) Weight carried exceeds tire load limit. This includes overloaded tire resulting from low air pressure. (Load Limit (393.75(f)); (393.75(g)(1)); (393.75(g)(2)); or, Inflation Pressure (393.75(h))
- (5) Seventy-five (75) percent or more of the tread width loose or missing, in excess of 12 inches (30.4cm) in circumference. (393.75(a)(2))
- (6) Bias Ply Tire: When more than one ply is exposed in the sidewall and the area exceeds 2 square inches (12.9 sq. cm). (393.75(a)(1))
- (7) Radial Ply Tire: When more than one ply is exposed in the sidewall and the area exceeds 2 square inches (12.9 sq cm.) (393.75(a)(1))
- (8) So worn that less that 2/32 inch tread remains when measured in any two adjacent major tread grooves (typically any groove containing a tread wear indicator) at 3 separate locations around the circumference of the tire at least 8 inches apart. (393.75(c))
- (9) Any vehicle where bias and radial tires have been combined.



13. WHEELS, RIMS and HUBS

a. Lock or Side Ring

Bent, broken, cracked, improperly seated, sprung, or mismatched ring(s). (393.205(a))

b. **Rim Cracks**

Any circumferential crack. (393.205(a))

c. **Disc Wheel Cracks**

- (1) Any crack exceeding 3 inches (76.2mm) in length. (393.205(a))
- (2) A crack extending between any two holes (hand holes, stud holes and center holes). (393.205(a)).
- (3) Two or more cracks anyplace on the wheel. (393.205(a))

d. Bolt/Stud Holes (Disc Wheels)

Any visible elongated bolt/stud hole. (393.205(b))

e. Spoke Wheel Cracks

- (1) Two or more cracks more than 1 inch (25.4mm) long across spoke or hub section. (393.205(a))
- (2) Two or more web areas with cracks. (393.205(a))

f. Tubeless Demountable Adapter Cracks

A crack exceeding 3 inches (76.2mm). (393.205(a))

g. Wheel Fasteners

Loose, missing, broken, cracked, or stripped wheel fasteners that are ineffective as follows: for 10 fastener positions - 3 anywhere or 2 adjacent; for 8 fastener positions or less - 2 anywhere (this applies to both spoke and disc wheels). (393.205(c))

h. Welds

- (1) Any cracks in welds attaching disc wheel disc to rim. (393.205(a))
- (2) Any crack in welds attaching tubeless demountable rim to adapter. (393.205(a))
- (3) Any welded repair on any aluminum wheel(s). (396.3(a)(1))

(4) Any welded repair other than disc to rim attachment on steel disc wheel(s). (396.3(a)(1))

i. Hubs

- (1) When any axle bearing (hub) cap, plug or filler plug is missing or broken allowing an open view into hub assembly. (396.3(a)(1)
- (2) Smoking from wheel hub assembly due to bearing failure. (396.3(a)(1))
 - NOTE: Also refer to "Brake Systems Brake Smoke/Fire"; as the cause may either be the brakes or a problem in the hub and bearing area.
- (3) When any wheel seal is leaking. This must include evidence of wet contamination of the brake friction material and accompanied by evidence that further leaking will occur. (396.5(b))
 - NOTE: Also refer to the applicable contaminated friction material criterion in "Brake Systems", when condition is present.
 - NOTE: Grease/oil on the brake lining edge, back of shoe, or drum edge and oil stain with no evidence of fresh oil leakage are not conditions for out-of-service.
- 4. Lubricant is leaking from the hub and is present on the wheel surface (caused by a loose hub cap or hub cap bolts, or hub cap damage) accompanied by evidence that further leakage will occur. (396.5(b))
- 5. No visible or measurable amount of lubricant showing in hub. (396.5(a))

14. WINDSHIELD WIPERS

Any school bus that has an inoperable wiper or missing, or damaged parts that renders it ineffective. (393.78)